

REMARKS

Prior to the present amendment, claims 1-16 were pending. Claims 10-14 were withdrawn by the examiner following a Response to a Restriction Requirement. In this amendment, claims 7 and 8 have been amended. Accordingly, claims 1-9 and 15-16 are under examination.

Claim 7 was amended to depend from claim 1. Claim 8 was amended to specify that the amount of azo-initiator in the container is preferably in the range of 100g to 10 kg, not 100 to 10 kg. Support for the amendment to claim 8 can be found on page 9, lines 26-27 of the application as filed. Accordingly, no new matter has been entered by the amendment of the claims.

The examiner objected to claim 7 under 37 CFR 1.75(c) and to claim 8. The examiner rejected claims 1-5, 8, 9, 15, and 16 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,902,596 to McVay, et al. in view of U.S. Patent Publication No. 2003/0108705 A1 to Duffield, et al.; and claims 6-7 under 35 U.S.C. 103(a) as being unpatentable over McVay, et al. in view of Duffield, et al., and further in view of European Patent Publication No. EP 0 668 098 A1 to Amo, et al.

OBJECTIONS

The examiner objected to claim 7 under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of the previous claim. Accordingly, applicants have amended claim 7 to depend from claim 1.

The examiner objected to claim 8 because of the broad and narrow range/limitation in the same claim. Accordingly, applicants have amended claim 8 to read from 100g to 10kg.

Applicants respectfully request reconsideration and withdrawal of the objections of claims 7 and 8.

THE INVENTION

The present invention relates to a polymerisation initiator system and a method of preparing a polymer. The system contains a water soluble organic initiator, *i.e.*, an azo-compound, for the polymerisation of monomers. The azo-compound is preferably within a water soluble container. The container and initiator are chosen so that they dissolve in the polymerisation system. The polymerisation system contains a liquid mixture comprising the compound or compounds to be polymerised, and optionally other components used in the polymerisation such as a catalyst, an emulsifier, and the like.

The polymerisation initiator system of the present invention provides a relatively simple and safe method and/or initiator delivery system to enable the producer of the initiator to transfer the initiator from its actual unit of production to the end-user without undue human exposure of the initiator at various stages of transport until transfer into the polymerisation reaction system.

REJECTIONS UNDER 35 USC § 103

Claims 1-5, 8, 9, 15, and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over McVay, et al. in view of the Duffield, et al. publication. The examiner states that McVay, et al. disclose an additive package for holding additives including an explosively decomposable polymerisation initiator catalyst in a stabilizing vehicle. The examiner further contends McVay, et al. disclose that the explosively decomposable organic catalyst may be an azo catalyst such as 2,2-azo(bis)isobutyronitrile. The examiner concedes that McVay, et al. is silent regarding a water-soluble container/package, the container including an anti-foaming agent or diluent, the amount of the initiator in the container, and the handling of the polymerisation initiator system. The examiner, however, relies upon Duffield, et al. for teaching water-soluble containers made of an injection molded polymer.

The Mc Vay, et al. reference, contrary to the examiner's assertions, teach away from the claimed invention. In particular, Mc Vay, et al. teach the use of a resin-soluble envelope and an explosively decomposable polymerisation initiator catalyst, wherein the catalyst is stabilized using a liquid vehicle, such as mineral oil, castor oil, and menhaden oil. After the

envelope is exposed to a resin, the catalyst disperses throughout the resin. See Mc Vay, et al. Example II, col. 7, lines 51-55 and Example IV, col. 8, lines 40-43.

Contrariwise, the claimed invention relates to a water soluble azo-initiator in a water soluble container. Unlike, Mc Vay, et al. the water soluble azo-polymerisation initiator in the container according to the invention does not require a liquid vehicle for stabilization. See page 2, last paragraph of the application as filed. Accordingly, the stability of the initiator is improved by using a water soluble initiator, preferably in powder or granulate form. See page 1, 3rd paragraph of the application as filed. Consequently, Mc Vay, et al. is a teaching away from the present invention which does not require a liquid vehicle for stabilization of the initiator.

Mc Vay, et al. further teach away from the claimed invention by stating that the catalyst disperses throughout the resin. See Mc Vay, et al. Example II, col. 7, lines 51-55 and Example IV, col. 8, lines 40-43. However, both the initiator and the container of the claimed invention readily dissolve when exposed to the polymerisation system.

Dissolving and dispersing are different processes, the results of which greatly affect the state of the polymerisation reactions. For example, because the initiator of the present invention dissolves, the polymerisation reaction is initiated more quickly than in McVay, et al. where the catalyst is dispersed.

Furthermore, less initiator is required in the present invention. In particular, the initiator typically decomposes after dissolution in a polymerisation system under formation of nitrogen and two free radicals, that are capable of acting as initiators for radical polymerisation. See page 5, lines 20-23 of the application as filed. However, the catalyst of Mc Vay, et al., which does not dissolve, is only initiated on the surface of the catalyst particles. Consequently, the Mc Vay, et al. system requires larger quantities of the catalyst, and the polymerisation reaction will be initiated at a slower rate compared to the polymerisation initiator system of the present invention.

The examiner relies upon Duffield, et al. for disclosing water-soluble containers made of an injection molded polymer. Duffield, et al., however, constitutes non-analogous art. Duffield, et al. relates to water-soluble containers for a household product, notably fabric

care, surface care, or dishwashing compositions. A person of ordinary skill in the art of making polymerisation initiator systems would not have been motivated to refer to the Duffield, et al. reference, which relates to a water-soluble dishwashing fluid holder, in order to create a water-soluble container for an azo-compound.

Furthermore, there is no reason to combine Duffield, et al. with Mc Vay, et al. Duffield, et al. does not teach or suggest that the water-soluble containers can be used to hold polymerisation initiators.

It is well settled that in order to establish a prima facie case of obviousness, one of the criteria to be met is that the prior art references, alone or in combination, must teach or suggest all of the claimed limitations. See MPEP § 2141. Neither Mc Vay, et al. or Duffield, et al. teach or suggest a polymerisation initiator system including a water-soluble container and a water-soluble azo-initiator inside the container. Accordingly, claims 1-5, 8, 9, 15, and 16 are not rendered obvious by McVay, et al. taken with Duffield, et al.

Claims 6 and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable over Mc Vay, et al. in view of Duffield, et al., and further in view of the European Patent Publication No. EP 0 668 098 A1 to Amo, et al. The examiner maintains that Mc Vay, et al. and Duffield, et al. are silent regarding the species of azo-compounds disclosed in claims 6-7 of the present invention. The examiner contends that Amo, et al. disclose a generic structure for an azo-compound that is very similar to the claimed azo-compounds.

As discussed above, Mc Vay, et al. teach away from the claimed invention. In particular, Mc Vay, et al. urges the use of a liquid vehicle to stabilize the sensitive catalyst, thereby teaching away from the present invention which utilizes a water-soluble initiator that does not require stabilization.

In addition, Duffield, et al. relates to water-soluble containers for household products, and as such is non-analogous art. Furthermore, there is no reason to combine Duffield, et al. with Mc Vay, et al. to create a polymerisation initiator system according to the invention.

Therefore, Mc Vay, et al. in view of Duffield, et al., and further in view of Amo et al. do not render claims 6 and 7 obvious. Accordingly, reconsideration and withdrawal of the 35 U.S.C. 103(a) rejection of claims 6 and 7 is respectfully requested.

Applicant respectfully submits that the application is now in proper form for allowance, which action is earnestly solicited. If resolution of any remaining issue is required prior to allowance of the application, it is respectfully requested that the examiner contact applicant's attorney at the telephone number provided below.

If any additional fees are due or any overpayment has been made in connection with this paper, please charge or credit Deposit Account No. 08-2461 for such sum.

Respectfully submitted,



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